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GREATER ROLE FOR SCIENTIFIC-TECHNICAL ASSOCIATION FORESEEN

Budapest MUSZAKI ELET in Hungarian 29 Apr 82 pp 1, 3

[Interview with Dr Janos Toth, secretary-general of the Federation of Technical and Scientific Associations by Gyorgy Pongracz; no date or place given]

[Text] Scarcely 2 months have passed since the Council of Ministers' decision that the MTESZ (Federation of Technical and Scientific Associations) will be included institutionally in the preparation and execution of all highly important--that is, forming a part of the economic plan--decisions belonging to the sphere of authority of the members of the ministerial council, the Council of Ministers and government committees. In addition to this decision, which represents a milestone in the life of the MTESZ, there are innumerable signs that the position and role of the Federation in our economy and social life has grown. The new situation, of course, is accompanied by new tasks and increased expectations that can be satisfied by an altered style of work. Gyorgy Pongracz, the chief editor of our newspaper, spoke with Dr Janos Toth about these changes and about the most important tasks of the Federation.

Prior to the decision by the Council of Ministers, the MSZMP Politburo discussed the report on the work of the MTESZ. The recommendation derived from the finding that the economic tasks of the coming period will pose increasingly higher requirements on the intellectuals in the field of economics and agrarian and natural sciences, and will make it necessary to discover intellectual reserves and use these more successfully. Therefore, their initiatives and creative work must be used in a more organized and purposeful way in the mechanism of political and state life, and in the preparation and execution of decisions.

In the realization of this task, an important and responsible role falls to the social organization of so-called practical intellectuals, the Federation of Technical and Scientific Associations and its 32 affiliates.

We Turned to the Government

[Question] Since the decision by the Council of Ministers, what kind of new tasks has the MTESZ leadership dealt with?

[Answer] The enlarged role of the intellectuals in the field of economics and agrarian and natural sciences is having a favorable effect on the creative spirit and action readiness of the Federation. At the same time, contradictions can still be felt between the increased demands and the factors obstructing implementation. We are trying to solve these with our own possibilities. The national presidium of the MTESZ discussed the experiences and lessons of the 13th General Assembly which was held in October of last year. We transmitted the observations and proposals of general interest that were voiced there to Comrade Ferenc Havasi, secretary of the MSZMP Central Committee, and Comrade Gyorgy Lazar, premier of the Council of Ministers. We expressed the desire that requirements of the technical, agrarian and natural scientific experts should be judged in a supportive way--in accordance with their merits and creative work--in the field of various social allotments and preferences, for example, in housing distribution, placements in nurseries and kindergartens, and so forth. We recommended a position which, independently of the present wage categories, would afford opportunities and incentives for outstanding creative work, and for more differentiated and higher material remuneration of producer and organizer work. We requested that they restore the training of technicians in a more modern form than existed previously.

We also turned to the government with several problems of the MTESZ itself. We raised the fact that in respect to financial accounting our activities which serve to disseminate trade information belong to the conceptual sphere of "operational representation"--constrained not only by form but also numerically--has in many cases an inhibiting effect.

We have already received the answer, namely, that the government organs will study the differences evident in social allotments and the possibility of their gradual elimination. They agreed with the need to modernize the training of technicians, and the Ministry of Education was given authority to find a solution. There will be opportunity for the Federation to cooperate in this search and to make recommendations. The premier agreed that there is in fact a need for greater moral and material recognition of creative work, but--as he emphasized--the local economic managers do not even make adequate use of the orders that are currently valid. The work plan of the Ministry of Finance for the first half year already includes a full-scale study of representation regulation. Better care will be taken to see that irrational prescriptions do not obstruct the transmitting of technical-scientific information.

[Question] Is the effect of the enlarged role of the MTESZ evident in relations developed with other leading organs, highest authorities, offices and institutions?

[Answer] Of course. It has had a very positive effect. They ask for and seek our views, recommendations and observations much more than before. Here is one example of how our situation has changed: now almost every ministry and national authority informs us of its annual work plan. The Ministry of Industry has specially asked for an expansion of our cooperation. Our

Federation is participating now in solving many economically important problems. We are trying to see that our members concentrate their intellectual strengths on important problems like, for example, energy management, electronic spare parts manufacture, the basic industry for the food economy, development of the pharmaceutical industry, innovation, environmental protection, the working out and testing of new methods for teaching language, the use and broad-scale circulation of innovations and inventions, or the modernization of the training of technicians.

At the request of the MSZMP Central Committee, we worked out proposals for a concept of public education; and in the spirit of a Council of Ministers' resolution "regarding certain timely tasks related to the Balaton recreation district" the government asked our Federation to work out a long-term development program for collaboration in the development of water management, settlement development, environmental protection, and the Balaton recreation district itself. This year on 11-12 June, under the organization of the SZVT [Scientific Society of Organization and Management] we shall arrange for the second exchange-of-experience conference of economic and personnel managers on the subject of personnel work. Now we are engaged in working out in greater detail our own methods for "opinion research." That is, we want to be able to measure accurately what is the opinion of the practical intellectuals regarding a given question.

[Question] What kind of demands will be placed on MTESZ work by the expanding role of the technical, agrarian, natural scientific, and economic intellectuals and the expected strengthening of their creative spirit and action readiness?

[Answer] We can meet the new, greater requirements only if we adjust the work of our Federation, the associations, and the area organizations. We not only ask that the decision-making organs seek out the views of our members but it is necessary that we actually be partners in coming up with well-founded observations and proposals. Our great, unprecedented strength is in the broad circle of our social workers. Therefore, in the coming period we shall have to rely to an encreasingly greater extent on the cadre of experts working in the associations. This raises the requirement that we must increase more and more the professional understanding of our colleagues in our organization.

Operational Activity at the Center

As the recommendation of the Politburo also emphasized, we must continue to place the development of operational activity in the center of association work. The operational organizations must contribute to a still greater extent to increased production efficiency, innovations serving more economic management, and the working out and implementation of inventions. The technical, agrarian, natural scientific and economic intellectuals must be drawn more and more through the scientific associations into the preparation of enterprise decisions and the working out of development plans. We must realize more and more that very important principle of ours of further strengthening the economic thinking of our technicians as well as the

technical interest of the economic intellectuals, and the implementation of this complex outlook.

Nowadays we speak a great deal about innovation and the need to follow and assist creative thinking from the inception of an idea to its implementation. The MTESZ has enormous tasks to do in this field. Of course, I am thinking of tasks which are appropriate to the social nature of our Federation. To do this, we also need a flexible organization. Naturally, we must also create appropriate conditions for the higher level activity of our experts. The experiences with the Technique Houses that are in operation also justify our continuing to establish facilities of this kind, with the support of government organs, in the megye seats and the more important industrial centers. Hopefully, they will also give support by granting us favorable judgment on their operation, and that together with other social organs these shall be prepared for multi-purpose use. Recently, the MTESZ and its associations were granted a favorable decision for their Budapest location. We were assigned the former building of the Ministry of Light Industry, which is an almost perfect solution provided we can realize certain remodeling plans.

Among the proposals we made to the government, there was one which also was appropriate to the position taken by our general assembly, namely, the need to create greater possibilities for using the expertise and experiences of retired people. Various statutory provisions are still in effect which limit or obstruct greater use of and material recognition for their intellec-capabilities.

[Question] Have the problems you raised gained a hearing?

[Answer] We have received encouraging replies to our observations from the appropriate organs. For example, they have informed us that they will study this year the present rules for the employment of pensioners, and in the second half of the year they will make proposals for their comprehensive modernization. It also brings us a good feeling and happiness to earn increasingly greater respect for our work in that the MSXMP Central Committee, the Council of Ministers, and the national authorities concerned are receiving with understanding and good will the matters we raised, our requests, our problems, and our proposals. I cannot even think of a subject where we did not receive a worthy reply. And these reactions clearly show an increased respect for and a readiness to help the intellectuals who are organized in the 32 associations. Our perception of this can only give renewed encouragement for our work and for the fuller use of the resources of our creative intellectuals.

With the Resources of Our Associations, Our Membership

[Question] What goals has the MTESZ leadership set for itself?

[Answer] Our observations and proposals now regularly come before the appropriate organs for information, for adopting a position, for making a decision. Beyond giving our views, we contribute to speeding up technical

scientific progress also by working out independent initiatives and concepts and by a systematic and rational conceptualization of the what and the how. As an example, I might mention our joint initiative with the SZVT for calling a national conference of engineers-in-charge, or the national conference on increasing the efficiency of intellectual work. Or to continue the list: study of pollution in the Balaton' proposals for the development of public education; working out of new methods for language teaching; and the inclusions of commission jobs into a unified system. To these questions are linked the planned establishment of the MTESZ council of experts and office of experts. It was with this same goal that we established the Council of Seniors among retired intellectuals.

All these efforts serve the goal of helping the social organization which unites 32 scientific associations or 170,000 members to successfully carry out the tasks stemming from the resolutions of the 12th Congress and the Sixth Five-Year Plan by mobilizing the intellectual resources of the technical, agrarian, natural scientific and economic intellectuals; by discovering the reserves of resources serving technical progress; and by continuation training of the specialists at a higher level.

[Question] What results has the MTESZ achieved in collaboration with the trade unions in particular with respect to the larger role and tasks of the practical intellectuals?

[Answer] Above all, I would like to emphasize that the relationships of the sub-branch trade unions and the scientific associations have become more sysematic, closer, more concrete and more manifold. The further development of this increasingly fruitful collaboration and its extension to more and more branches is constantly on the agenda of our Federation. As a good example of our collaboration I might mention the jointly announced fifth national conference of innovators and inventors. We should work to assure that fewer and fewer good ideas are lost and that the material and other kinds of conditions for innovative activity should be improved. It is our joint task with the trade unions to see that the material and moral recognition of the technical, natural scientific, agrarian and economic intellectuals should increase in harmony with achievements, and that the power of attraction exerted by a technical career should grow. In order to put our economy on an intensive track, it is our joint goal to improve the effectiveness of intellectual work. In our Federation and our associations as are constantly studying and examining those conditions and factors which have a restraining effect on technical progress and knowledge. Tensions and problems arise in this connection. In our judgment, it would help a great deal if the trade unions were to react more rapidly and concretely to problems. We must improve this cooperation, and with this strengthen confidence between the trade unions and the intellectual workers. I am convinced that in the future the trade unions will do more and more for the development of the professional knowledge and creative energy of intellectuals.

Cooperating with the Trade Unions

In addition to material recognition, we need for the development of a better working atmosphere better recognition for specialists offering an outstanding

product, and an improvement of conditions. In any event, the national presidium of the MTESZ sees it as necessary to study in intellectual areas the more consistent realization of the principle of distribution according to work, accepting also a substantially greater extent of income inequality than at present.

The indispensable condition for the development of creative work at enterprises is the strengthening of democratism at institutions. It is the joint task of the MTESZ and the associations together with the trade unions to work out organizational forms and working methods that will make it possible for the practical intellectuals to participate more directly in the handling of common affairs. We can do a great deal through education and attitude formation to realize an unselfish will to do instead of the excessive materialism that is unfortunately evident in so many places. But at the same time this also means that we must manage human capabilities better and give more support to those who accept sacrifices for the common good.

It has already been emphasized at the meetings of our general assemblies that we are not an interest representational or interest protection organization. In accordance with our political and social development, this is attended to basically by the trade unions. In this area we do not wish to compete with them, but to help and to cooperate with them. It is also stated in the recommendations of the Politburo that our Federation should develop its relations with the trade unions. We should be able to strengthen our cooperation not least of all through the work of our plant and enterprise organizations. We need to promote an improvement in the efficiency of production, the working out and implementation of innovations and inventions which serve economic management, and activity in this direction by the working collectives and the socialist brigades.

[Question] As it appears frmm a review of the recent past, the MTESZ role in representing 32 scientific associations and the approximately 170,000 practical intellectuals who are its members has increased perceptibly. This is reflected in the respect shown by party and state organs and in the seeking out of Federation views on important decisions at the national economic level. Therefore, the tasks, too, have increased. Will the MTESZ and its associations be able to meet the greater expectations?

[Answer] This is our goal and we are working at this. We wish to adjust our working methods, our personnel and organizational structure, the inner life of the MTESZ and the associations to the new requirements.

Let Us Make Our voice Heard

The recognition we have received thus far is an honor to us as well as the request that we make our voice be heard in more and more questions of national economic importance on the basis of views formed in our associations and the Federation. Most recently, for example, we received a letter from the Council of Ministers in which they judge as valuable the proposals made in our comprehensive informational notice on the first national exchange-of-experience conference of engineers-in-charge, as well as the positions we

have taken and the observations we have made on the development of guidelines for housing construction and maintenance, and on housing management and distribution.

The reactions by the managing organs to the questions we have raised show that the expert positions and thought developed by the voluntary work of the association memberships are important. Moreover, we must strive to an increasingly greater extent to come up with concrete proposals in given questions as to what the authorities should do, and how, for the solution of problems and tasks. We are continuing to work on this, for the intellectual resources of our membership is capable of doing all this. And the conference that is being shown in us is multiplying our strength. At the same time, however, it indicates that we, too, must do much more than before for the attainment of national economic goals. And in order that in the coming period as well we shall be worthy of increased confidence.

6691
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ORGANIZATIONAL CHANGES IN COMPUTER ENGINEERING COLLABORATION

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 p 1

[Article by Tamas Hirschler: "Organizational Modifications in the Guidance of International Computer Technology Cooperation Activity"]

[Text] In January 1981 the Computer Technology Inter-Ministerial Committee passed a resolution concerning the combining of background organizations coordinating domestic and international computer technology cooperation. The purpose of the reorganization was to make branch guidance more effective, optimize the number of people in the guidance apparatus and improve the efficiency of international cooperation. The computer technology central development program (SZKFP) adopted for the Sixth Five-Year Plan also conceptionally urged a regrouping of the tasks of the secretariats and offices performing coordinating activity.

At the end of last year, after such antecedents, the office of the Hungarian members of the Economic Council of the Computer Technology Inter-Government Committee (SZKB GT), the International Secretariat for Bilateral Computer Technology Cooperation (KSZENT), the Computer Technology Technological and Parts Coordination Office (SZATKI), the Technical Coordination Office for Computer Technology Cooperation (SZEMKI) and the Computer Technology Research Information Service (SZKISZ) were combined. With the creation of the new integrated guidance system we achieved a reduction in personnel of about 40 percent and annual upkeep costs savings of 33 percent. The name of the new office is the Information Office Coordinating International Computer Technology Cooperation (NESZEK). Its address is Lenin Korut 77, Budapest VI, telephone 324-977.

The office is in the supervisory sphere of the Ministry of Industry and the OMFB [National Technical Development Committee] and it carries out cooperation and coordination tasks being realized within the framework of their ministerial obligations set forth in the SZKFP. The work apparatus of the chief authorities mentioned is maintained within the enterprise framework of the Videoton Industrial Foreign Trade Company, on a contract basis. The organization continues to carry out the secretariat and technical coordination tasks of the SZKB GT, of the permanent bilateral computer technology work groups (between ministries or technical development guidance organs) and of the domestic memberships of the SZKB [Computer Technology Inter-Government Committee] Temporary Technological Work Groups; it keeps the

administrative records for the research and development activity of the Computer Technology Research Target Program (SZKCP); and it operates the information system for basic data summarizing the achievements of the SZKFP.

The office is divided into three units: a department dealing with questions of bilateral cooperation, a department dealing with tasks of multilateral cooperation and a department operating the information system.

Practical work after the reorganization began at the beginning of January and in the transitional period it took care of tasks deriving from the earlier organizational structure and system of responsibility also. The regrouping took place without a hitch in the midst of substantive work. It is very gratifying that the personal and work contacts developed earlier with producing and foreign trade enterprises belonging to the contacts system for coordination work were maintained without change. They related with understanding patience and aid to the hang-ups which could be experienced unavoidably as a result of the reorganization. We must see in this, unambiguously, a recognition of the activity of the earlier coordination organs and a manifestation of trust toward the new office.

Within the framework of the information system of the SZKFP the office primarily collects, systematizes and maintains special records on enterprise production data and foreign trade data according to functional nomenclature or the ITJ [Industrial Products Register]. The data base is being supplemented with data summarizing research expenditures and results and with information recording technical-scientific cooperation tasks and evaluating results. The data base is still being designed; data collection will begin soon in accordance with the pertinent state prescriptions and permits. Full operation of the office is expected in the second quarter of the year.

The chief authorities cooperating in the creation of the office are turning great attention to classified handling of income data, to protect the institutional interests of the enterprises supplying data. A strict system controls the "out-flow" of synthesized data--and of the primary data submitted. The pertinent prescriptions apply to the activity of the office as a whole.

We believe that the creation of the new office represents not only a single organizational modification but rather a considerable improvement in coordination activity and the decision preparation mechanism as a whole and that it will result in a modernization of information flow. The necessary organizational, material and personnel conditions are given.

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HUNGARIAN COMPUTER EQUIPMENT IN USSR

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 p 11

[Article by Otto Molnar, director of the Moscow Commercial and Technical Center of the Videoton Company, and K. Borisov, deputy director of the center: "Hungarian Computer Technology Equipment in the Soviet Union"]

[Text] In Hungary the Videoton Electronics Enterprise, the MTA SZTAKI [Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences], the SZAMKI [Computer Technology Research Institute] (the legal successor is the SZAMALK[Computer Technology Applications Enterprise]), the SZKI [Computer technology Coordination Institute], the KFKI [Central Physics Research Institute], etc. deal with the development of computer technology. Their activity is guided by the Computer Technology Inter-Government Committee (SZTB) [as published, "Inter-Ministry" was probably intended], which also makes up the Hungarian membership of the Computer Technology Inter-Government Committee(SZKB). The OMFB [National Technical Development Committee] undertakes a decisive part of the guidance of development.

Within the framework of the SZKB a developmental program for computer technology devices based on a uniform technical policy has been developed and basic principles for specialization among the individual countries have been defined. In accordance with the specialization principles Hungary began participation in the common work with the manufacture of the ESZ 1010 computer and a number of peripherals.

As of 1981 Hungary has been manufacturing the ESZ 1011 computer in place of the ESZ 1010. Its technical and economic indexes substantially exceed those of the previous model.

The most significant manufacturer of computer technology devices in Hungary is the Videoton Electronics Enterprise. The crucial majority of the computer technology devices manufactured are exported to socialist countries. The greater part of the deliveries are to the Soviet Union. Between 1976 and 1980 the value of the deliveries exceeded 300 million rubles. At present, working in various areas of the Soviet economy, there are 50 configurations of the ESZ 1010B systems and 300 configurations of the ESZ 1010 model--there are 61 in the area of the Railways Ministry, 53 in the area of the Energetics Ministry, 27 in the petroleum and gas industry, 30 with the Ministry

of Geology, 50 systems in institutions under the Academy of Sciences of the Soviet Union--including the federal republics--and a number of systems in other branches of the economy and in other scientific research institutes.

The systems delivered thus far work as modern decentralized data processing tools and as medium capacity computers in larger computer technology networks.

Videoton Reference Systems

At the Energetics Ministry the systems serve to collect, process, display and document information arriving at the dispatcher points of the power systems and energetics associations.

The computer technology systems operate in accordance with the operational mode of the energetics system operating under their guidance. They display processed information on a picture screen, monitor the parameters and operation of the energetics systems, forward informational data to the dispatcher and, in the event of a breakdown or if the values of the parameters being monitored go beyond the given limit values, forward warnings to the dispatcher. All central dispatcher stations of the ministry are supplied with ESZ 1010 computers.

At the Railways Ministry they have developed a computer guidance system for marshaling yards. Its fundamental tasks are:

--processing the documents and technological information accompanying the cars in such a way that instructions for assembling trains can be compiled on the basis of this information,

--developing an information data base concerning the location of cars standing in the yard, and

--preparing operational and summary reports on work done by the marshaling yards by shift and by day.

The use of computers at the marshaling yards makes possible a perfection of the technological processing system of the yards, decreases the idle time of cars, improves the working circumstances of those working in the technical offices and decreases the manpower expenditure.

At the Ministry of Geology they developed from a two-computer ESZ 1010 system an automated ocean survey station of the MARS type. The systems, operating on research ships, are used to collect, process and store geophysical and radio navigation data. The computer technology system is the chief element of the automated navigation system. A navigation system working with the aid of artificial satellites is part of this also. With the aid of the MARS system the efficiency of ocean bed research work has increased greatly and it is possible to determine with much greater precision the sites of certain mineral deposits on the ocean bed. Similar systems are used in geophysical research on dry land also. The computer technology system stores the data received and displays the results as desired on a plotter or on light sensitive paper.

Technical Services for Videoton Products

Hungary provides complete technical services for the computer technology devices deliverd by it also. For this purpose we gradually built up, beginning in 1972, an organization which is called, since 1977, the Moscow Commercial and Technical Center of the Videoton Company.

The basic tasks of the center are:

It discusses the following matters with the Soviet foreign trade organs and Soyuzglavpribor, the supply enterprise belonging to the Material Supply Committee of the Soviet Union and the enterprise which is the general purchaser of Hungarian computer technology equipment:

--delivery volumes,

--the configurations to be delivered and the time limits for delivery,

--prices, and

--signing the delivery contracts.

The Commercial and Technical Center provides complex technical service for the computer technology devices delivered, performing the following tasks:

--technical acceptance of machine products ready for assembly,

--assembling and putting into operation the systems jointly with the users,

--guaranteed servicing of the equipment during the 12-month guarantee time,

--repairs which become necessary after the guarantee time, on the basis of special contracts pertaining to services beyond the guarantee time, and

--training the experts of the user organizations within the framework of an appropriate study course system.

Hungarian and Soviet experts and service personnel work in one collective in the center. Personnel now number 175 of whom 121 are Soviet and 74 are Hungarian [as published].

In the interest of the successful performance of the tasks the Commercial and Technical Center is organized into the following units:

--management (the director and two deputies),

--training group,

--software group,

--service groups (to repair different types of equipment),

--claims group,

--laboratory,

--computer center,

-administration and customer service group, and

--warehouses.

From the moment a system reaches a user we precisely document what work we have done and what changes we make in connection with the given system.

Users can report problems arising to the dispatcher center. The dispatcher informs the chief of the appropriate group who sends experts, equipped with spare parts, tools and instruments, to remedy the problem. Parts and subassemblies which fail for the user are required in the laboratory. These (after repair) are put in the warehouse.

The computer center of the Commercial and Technical Center operates ESZ 1010 and ESZ 1011 computers. The training of users takes place here also.

In the course of the present five-year plan (1981-1985) we expect a significant increase in delivery of computer technology devices of Hungarian manufacture. The ESZ 1011 systems to be delivered are more modern and their technical and economic indexes are better. Among its peripherals one can find picture screen units and output devices, fixed head magnetic disk stores and line printers.

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PRESENT, FUTURE OF MINICOMPUTER SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 pp 8-9

[Article by S. S. Zabara, B. N. Naumov, V. V. Rezanov and E. B. Smirnov: "Computer Technology in the Soviet Union; The Present and Future of the Minicomputer System"]

[Text] The fundamental applications areas for the MSZR [Minicomputer System] computer family are guidance systems for discrete and continuous technological processes, automation systems for scientific experiments, the systems needed for realization of automatic designing, and organization and guidance tasks. The many types of applications required that we solve, at the state and international level, a number of technical-scientific, production and economic problems. The more important are:

--unformization of technical devices and the methods of linking them (standard interface),

--adopting methods for basic design and development of special purpose systems which would make possible in a broad sphere the design and assembly of special systems and later duplication of them,

--realizing uniformization of design and technological solutions, at the level of international standards, which would ensure outstanding quality of the computer technology devices, the possibility of inter-branch and international cooperation and the possibility of conversion from large series computer technology production to mass production,

--development of uniform requirements necessary in regard to a long-range microelectronic element base, and

--organizing a countrywide network of institutions to provide assembly, installation and complex technical services.

The very short time available to us to create the MSZR required that we introduce new work organization methods. In the development of minicomputers we used for the first time in the Soviet Union a method of parallel execution of developmental phases which previously had been carried out sequentially; the development of technical devices, programs and user systems took

place in parallel. Simultaneous with this the electronics industry developed the modern elements base the mass use of which in the MSZR made possible a significant improvement in the technical quality of the products. We optimalized the structure of the MSZR computer family in such a way that the central units, and in some cases the control units for peripherals, could change for some models, but the basic assortment of peripherals and the devices to link computers are essentially the same for every model.

The basic technical solutions adopted within the framework of the MSZR satisfied the requirements for mass manufacture and can guarantee the possibility of automated or highly mechanized production. High level technological production preparation activity took place to introduce series manufacture of the MSZR.

At one of the leading enterprises of the sub-branch, the Kiev unit of Elektronmas, they operate five technological process control systems and 40 automated tuning and measuring systems on the SZM-4 manufacturing line for operations requiring the greatest responsibility. Beginning in the second year of their production they have been using SZM-3 and SZM-4 computers to carry out guidance and control tasks for the computer technology sub-branch The computers used for design of printed circuits, control of drill lines and final alignment have proved very effective.

Stepping up the production of computers makes it important to perfect and accelerate the development of the technology for program preparation and putting systems into operation. Solving these tasks made it possible this to be the first computer family in the Soviet Union for which users received an adequate supply of basic and applications programs immediately after series manufacture began.

Characteristics of the First Series of MSZR Computers

When executing short arithmetic and logical operations the speed of the processor reaches one million operations per second. Rational operational paging, using primarily hardware for processing interrupts and the possibility of automatic setting to different operational modes ensures that the SZM-4 models--the fastest MSZR computers--give a speed of 300,000 operations per second for real-time applications, recalculating to mean operations. (We established this with measurements done for a large number of real-time applications.)

Creating complex guidance systems, introducing optimalization methods and data base management, requires that there be available a larger operational memory than heretofore, together with the possibility of multi-level external information storage. The SZM-4 and SZM-2 models work efficiently with a memory of 128 K words. This satisfies the requirements of most technological process control, scientific research and scientific experiment automation applications and most dispatcher guidance systems.

Peripherals

Development and series manufacture of the peripherals needed for the mini- and microcomputers occupy a central position in the MSZR program. The price

of the peripherals makes up 70-80 percent of the price of computer systems and the peripherals have a crucial effect on the technical and use parameters of applications systems and on their productivity and reliability. The very broad applications sphere of the MSZR computers makes necessary a large assortment of peripherals.

At present the assortment of MSZR peripherals contains every type of device practically needed for creation of computer guidance systems in the various areas of the economy. The assortment contains more than 100 items of equipment, not counting the equipment needed for remote processing, the equipment added for process control and equipment recording production.

A functional line of external storage devices based on magnetic data carriers has been developed. This includes cassette magnetic disc stores up to 30 M byte capacity, cassette and normal magnetic tape stores and floppy disk stores. The family of printers contains character (synthesizing) equipment with speeds of 100-180 characters per second and line printers with speeds of 500-900 lines per minute. In many places they are using picture screen equipment--alphanumeric and graphic displays, including intelligent, color and semi-tone devices. Substations represent the equipment providing a link between operator and machine, these include two types (black, white) of displays with capacities of 512 or 2,000 characters. They are equipped with the tools needed for editing and the graphic display makes possible the drawing of mnemonic designs. It is possible to develop process control technology work sites where one can observe the functional needs of the engineering work sites and the topological arrangement of the system.

Research on peripherals operating on the basis of traditional principles is aimed at improving the technical and economicalness indexes.

This includes the following:

--in the case of magnetic storage equipment we must increase reliability, the speed of information transmission and the density of writing. This will require use of integrated magnetic heads and a perfection of the magnetic layers of the carriers;

--in the case of picture screen equipment we must increase the processing capability, the number of degrees of light and the built in intelligence; and

--in the case of striking printer equipment we must increase reliability and capacity and decrease the size and the amount of noise.

In the further development of the MSZR peripherals we adopted as a base the principle of decentralized control. Peripherals will be connected to a computer technology system in the form of a system or terminal and will be equipped with microprogrammable control equipment or built-in microprocessor. The development of the microprogrammable control equipment for this purpose is already finished.

The development will provide the following advantages:

--the task of assembling special purpose systems will be substantially simplified (especially for systems distributed in space) and the generation of operating systems needed for these will be substantially simplified;

--it will be possible to produce subsystems separately, autonomous functional control will be possible and it will be possible to deliver them to users separately;

--the way in which subsystems are used will be simplified, primarily because it will become possible to test and diagnose them autonomously;

--the time and memory of the central unit can be used more thriftily and the reaction capability of the system will increase; needs supported by central unit reactions will decrease; unforeseeable coincidences and conflicts can be eliminated (these occur in present systems because the various units of equipment operate independently of one another in an asynchronous . ay);

--connecting peripherals will be simplified and the further perfection of them will be easier; and

--in the great majority of cases sizes and prices will be reduced substantially and the reliability of the entire system will increase.

Examples of Developing Systems

In the case of equipment for the SZM-3 and SZM-4 computers, an adapter providing a link between the AMSZ processors and a PS bus connector serve to create multi-computer and multi-processor systems. The adapter providing contact between processors can be connected to the common bus lines on both processors. Via the adapter any processor of a multi-computer system can turn to any other processor, or to a peripheral of the other computer, if it is connected to the common bus. By means of a program it is possible to provide which parts of memory can be accessed by other processors.

Depending on the concrete applications conditions a two computer system, for example, can be used in the following operational modes.

--The P1 processor has a P2 processor as a reserve. In this case the P2 processor processes information in the background mode and from time to time asks the other processor for use of the bus connector.

If the P1 processor fails then the bus connector switches to the P2 processor which immediately takes over control in the real time mode. The operative nature of the system can be increased if a supplementary operational memory is connected to the supplementary bus also.

--Division of functions. One can imagine, for example, that the P1 processor takes care of collecting information, swiftly evaluating it and writing it onto external data carriers in accordance with the loading of the memory.

The P2 processor, on the other hand, going through the bus connector at certain intervals, accesses the information and processes it in accordance with the previously supplied, complex algorithm.

Remote Data Processing Devices of the MSZR

The following types of equipment are planned to develop remote processing systems based on the MSZR: modems, signal transformers, multiplexers and adapters, automatic call equipment and a number of terminals made up of different components for different purposes.

Here are a few examples of the possibilities for developing remote processing systems based on the MSZR:

--links between a computer technology system and remote terminals;

--links between a computer technology system and remote terminals in such a way that conversations needed for service can be conducted through a telephone connected in parallel.

--linking two computer technology systems via a leased or connected telecommunications line, with the possibility of making an automatic contact;

--linking a computer system to a terminal in the immediate vicinity; and

--linking a computer technology system based on the MSZR with a system made up of ESZR [Uniform Computer Technology System] equipment.

Software

As a result of the realization of the first MSZR series a base of modern technology was created to develop porgram products and document programs. In harmony with the general basic principles of the problem oriented nature of MSZR systems the technological tools and devices needed to design and develop program products are goal oriented also, according to the following principles.

The program modules serving as basic tools can be grouped as follows:

--logical and mathematical processing of data; these include programs for mathematical statistics, numeric analysis, optimalization methods, network design methods and guidance methods based on network plans, etc.;

--data processing technology programs, which provide for collection of data preliminary processing, reading in data with various formats, data transmission on telecommunications lines, creating and supplying data structures, displaying data, etc.;

--programs to control and service peripherals, provide syntactic and semantic expansions and set up links between multi-computer systems;

--programs to check and diagnose technical devices;

--organization and guidance of computing processes; and

--programs facilitating the link between user and system.

Tools serving to generate operating systems represent the next, higher level of programming tools. With the aid of these one can adapt to various applications conditions and to various configurations of computer technology systems.

We kept in mind primarily the ability to generate the following types of operating systems:

--general purpose systems for program preparation and testing (punch tape and disk based);

--real time systems (multiprogramming punch tape and disk systems for small configurations, systems to control processes which take place quickly, systems running several tasks simultaneously and serving a broad sphere of applications, where one must control systems consisting of many and complex elements in real time);

--time distribution systems (where one must solve informational and logical or calculation oriented tasks in a collective user operational mode); and

--systems for complex measurement and testing of technical tools.

Under the control of the operating systmms one operates programming systems which can provide, in the conversational mode, preparation and testing of programs in the following languages: Assembler, Macro-Assembler, FORTRAN, BASIC, BASIC-Plus, DIASP, DIAMS and COBOL. We developed a number of applications program packages to expand the possibilities of the operating systems and strengthen their problem oriented nature; these packages are procedure or problem oriented. These include progrmas for numeric analysis, mathematical-statistical, network design and guidance programs, programs for object link and remote processing equipment, computer graphics programs, programs to manage data banks in hierarchical multi-computer systems, programs to model continuous, discrete and semi-continuous processes, programs for technical-scientific and economic calculations, instructional systems and data processing systems to automate scientific experiments.

Basic Trends of Further Development

A complex program, worked out for the years 1981-1985, for manufactuer and further development of MSZR technical and program tools provides the basis for the work being done in the Soviet Union, and parts of it deal with the work of countries participating in the computer technology cooperation of the socialist countries.

Each model of the second series will be made on the basis of highly integrated circuits, including n-MOP technology, 8 and 16 bit microprocessors and solutions based on low output TTLS technology.

The models in this category can be used to develop computer systems with various configurations (such as a system for economic calculations based on

the SZM 1800) or to build up hierarchic and distributed systems, including remote processing networks. They are compatible at the program level with the SZM-3 and SZM-4 machines and have an adaptive architecture to operate at the highest level of hierarchic systems; in addition to the basic operational mode they are capable of being operated in a mode compatible at the program level with ESZR machines or (if need be) in the operational mode of other computer systems.

Research being done in the area of peripherals based on new principles will make it possible for us to create in the next five-year plan:

--optical-electronic information storage devices working on the basis of photographic or thermic carriers;

--peripherals for input and output of graphic and symbolic information working on color ray and laser principles;

--information display devices based on lasers and gas discharge;

--medium integration microcircuits based on TTLS technology;

--static and dynamic operational storage units using highly integrated circuits made with n-MOP or K-MOP technology;

--TTLS based PROMs;

--programmable logic matrixes based on TTLS technology; etc.

We hypothesize the creation of the following basic computer classes:

--Microcomputers intended for autonomous applications, intelligent terminals, terminal substations, industrial control equipment, etc. Taking into consideration the requirements of systems applications we have considered, in addition to the basic design, the creation of microcomputers which can be used in especially hostile environments or those which meet CAMAC standards for systems automating scientific research.

--A computer series which will be compatible at the program level with the machines of the first series, the SZM-3 and SZM-4, but which will have higher technical-economic and utility parameters. In the configurations of such machines there will be special processors for various purposes (oriented toward matrix operations, languages, file management, etc.) which will make it possible to increase the power of these machines by one or two orders of magnitude when solving the appropriate tasks.

We plan to create an equipment assortment from which one can create many versions of computer technology systems, guidance systems and computer networks. The link between elements in the networks can be any standard telecommunications channel--teletype, leased or connected telephone line, galvanic line. In addition to traditional data transmission equipment we plan the development of terminals and terminal substations which make

possible the creation of functionally complete remote processing systems, based on uniform technical and programming principles, all the way from multi-terminal substations to network remote processing systems.

The program includes the development of software with which one can operate highly reliable multi-terminal systems distributed in space in which--in the collective operational mode--it will also be possible to do testing and remote diagnostics. There will be technologically oriented program systems for program development, preparation of documentation and user instruction and various applications program packages for the areas in which the MSZR is most often used.

The program also proposes the development of several types of computer systems based on multi-computer configurations which may be the basis for the development of concrete user oriented systems. First of all this will involve two computer systems realizing various types of cooperation between the two computers.

Implementation of the program will make it possible for us to achieve the front rank in regard to all basic user criteria--functional completeness will expand, capacity will increase, more varied configurations can be developed (this includes program tools) and the reliability and life expectancy of systems will increase.

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ELEKTRONIKA-60 MICROCOMPUTER

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 pp 9, 11

[Article by Jozsef Bella: "The Elektronika-60 Microcomupter"]

[Text] There is ever increasing interest in microcomputers not only throughout the world but among domestic users also. This is justified by the small size and relative cheapness of the equipment. They can be used best as independent data processing systems in various areas of economic, scientific and technical life but they can also be elements of "network" systems and can guide production and technological processes.

The Elektronika-60 (EL-60) is manufactured by the Electronics Association which belongs under the supervision of the Soviet Electronics Industry Ministry.

In regard to both hardware and software it is compatible with the DEC LSI-11 computer. Its instruction set (which is compatible with the PDP 11/35/40 instruction set) makes it possible to exploit the advantages of PDP 11 software.

Thus one can run on the El-60 the developmental programs of the PDP 11, such as ASSEMBLER, LINKER and EDITOR, the loading programs, user program packages, operating systems and translator programs for high level languages.

The system has modular construction; each functional unit makes up one block and information exchange between blocks takes place on a common channel (bus). Thus the computer makes up a modular system linked together by the bus. Since the link between individual units of the modular system takes place in the same way via the bus the peripherals can be accessed by the central unit as easily as the operational store.

The advantages of this solution are:

--the central unit can exchange information with any peripheral without using memory, and

--the peripherals can exchange information with memory and with each other without the central unit.

The link between units connected to the bus takes place on the MASTER-SLAVE (active-passive) principle. At any given moment only one device can be active and can initiate information exchange. The MASTER unit controls the cycle for turning to the bus, satisfies--if necessary--the interrupt request of the peripherals and controls direct access to memory. The SLAVE unit can only execute and can take or give information only under control of the MASTER unit. A typical example of such a link is the link between the central unit (as MASTER unit) and memory (as the SLAVE unit).

The link via the bus is closed; that is, an answering signal from the SLAVE unit must be given to the control signal given by the MASTER unit. Thus the process of information exchange between them is not dependent on the answering time of the SLAVE unit (within 10 microseconds). As a consequence of this there is no need for so-called cycle signals--this the link is asynchronous. Information exchange can take place with any unit at the maximal speed determined by the unit.

The bus makes possible various data transmission methods--program controlled, direct memory access and program interrupt.

Program controlled data transmission is data transmission initiated by the controlling program. Prior to initiating data transmission the content of the state register of the unit must be checked to see if the unit is ready to carry out data transmission. The direct memory access method is the fastest data transmission method between memory and a given peripheral. This data transmission does not change the state of the central unit. That piece of equipment which is working in the direct memory access mode must carry out all the functions of the MASTER unit--addressing, producing control impulses and, if necessary, regeneration of memory, checking the length of the block of data to be transmitted, etc.

A given peripheral can receive authorization for direct memory access only after completion of the running turn-to-bus cycle, that is, in the pause between the execution of two instructions. At the time of program interrupt the central unit serves the unit requesting the interrupt. The units requesting interrupts have a special program to handle interrupts, entry into which takes place with the aid of a so-called interrupt vector. Addresses 08 to 3768, expressed in the hexadecimal number system of the operational store are maintained for the interrupt vectors. Each vector needs two 16 bit store cells so the addresses of the interrupt vectors are paired and can end in 0 or 4. The interrupt system is a priority system with multiple levels. The individual peripherals are connected to a definite level. Several peripherals can be connected to single levels. The order is based on the electric distance of the devices from the central unit. That unit has higher priority which is closest to the central unit electrically. Any unit can again interrupt the program serving the first unit if the state register of the central unit makes this possible. Thus the service programs can be "embedded in one another" to the level desired.

When determining the priority order the following factors must be considered: fast devices have highest priority; but highest priority must also be given to those devices from which the originating data cannot be repeatedly produced.

Technically the common bus organization also has the advantage that it makes it possible to address and handle the state, address and data registers of the peripheral controls as memory cells. Since the central unit turns to the registers of the peripherals in the same way as it turns to memory those instructions which handle data to be found in memory can be used to handle data to be found in the registers of the peripherals also. Data which can be found in the registers of peripherals can be analyzed without sending them to memory or a general purpose register, or one can perform on them arithmetic and logical transformations.

In general the upper 4 K addresses of memory are peripheral registers. The basic functional blocks of the central unit are the LSI IC's making up the microprocessor:

--control IC,
--arithmetic-logical IC, and
--three permanent memory (RAM) IC's.

The central unit is microprogrammed. The microprogram memory contains the microinstructions. The microinstructions emulate the instruction system of the computer and control the internal registers of the central unit and its arithmetic-logical unit, internal information traffic, maintaining contact with the bus and the loading of the initial program.

The arithmetic-logical unit also contains the eight fast general purpose registers which carry out various functions.

They can be used as storage, index, auto-incrementing, auto-decrementing and stack-pointer registers.

The chief technical data of the central unit are:

--Instruction system: no address, one address, two address.

--Addressing modes: register, intermediate register, automatic incrementing and decrementing, intermediate automatic incrementing and decrementing.

--Levels of requesting bus service: two.

--Levels for peripherals to request bus service: three.

--Number of instructions: 80.

--Cycle time of memory: a maximum of 2.4 microseconds.

--Method of information processing: parallel.

--Method of control: microprogrammed.

--Arithmetic operands: fixed decimal, floating decimal.

--Length of arithmetic operands: 16 bits with normal precision.

--Length of arithmetic operands: 32 bits with double precision.

Memory: This serves for temporaty storage of information and is connected directly to the bus. In its basic design the EL-60 has 4 K words of memory (one word equals 16 bits), which can be expanded to 32 K words. The manufacturing firm has developed two models to expand memory, the P-2 (4 K words) and the P-3 (16 K words).

Peripheral control adapters: The many types and large number of peripherals which can be fitted to the EL-60 computer are well known. Like the memory module the peripheral controls are connected directly to the bus. Both a Consul-260 typewriter and a picture type terminal can serve as console.

The peripheral control adapters developed for the EL-60 computer are: V_1 for the consol (Consul-260 typewriter); V_{21} for the tape punch (PL-150); V_3 for the punch tape reader (FS-1501); Y_2 is a parallel control adapter (maximum data transmission in the case of programmed control, 180 K bytes per second); Y_3 for a DMA (direct memory access) UUML magnetic tape unit (SZM 5003); Y_4 for a (NGMD) floppy disk, control adapter for the SZM 5400 magnetic disk; and Y_5 is a sequential control adapter with a transmission speed of 50, 9,600 bits per second.

The present programs for the EL-60 are: paper tape operating system; EDITOR, ASSEMBLER translator, editor; BASIC, test programs.

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PARTICIPATION OF THE SOVIET RADIO INDUSTRY IN THE UNIFORM COMPUTER SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 p 9

[Article by J. P. Selivanov, NICEVT: "Computer Technology in the Soviet Union; Participation of the Soviet Radio Industry in the ESZR (Uniform Computer Technology System)"]

[Text] At the time of the signing of the Inter-Government Agreement aimed at the multilateral computer technology cooperation of the socialist countries very much experience had accumulated already in the Soviet Union in the area of developing and organizing series manufacture of second generation computers belonging to the various classes. In the socialist countries also there was rather wide knowledge of the BESM and Minsk computer families, the M-220 and M-222 computers, produced by industry at the end of the 1960's and the beginning of the 1970's. We can regard this production experience as one of the most significant contributions of the Soviet Union in the initial phase of cooperation.

In 1968-1969, in the period immediately preceding the signing of the Inter-Government Agreement, preliminary plans were being prepared in the Soviet Union for a family consisting of third generation computers compatible with one another at the program level, a complex standardization program in the area of computer technology had begun, industry was being prepared to accept new technological processes, factories producing computer technology devices were being expanded and new ones were being built. This work followed directly from the resolution of the 24th congress of the CPSU which prescribed a perfection of the guidance system of the economy.

After the signing of the agreement the Soviet experiences became accessible to developers of all participating countries and they were used successfully in the following stages in execution of the long-range cooperation program in one of the most advanced and extraordinarily swiftly developing areas of industry, the computer technology industry. In many respects this was decisive in regard to the technical and scientific progress of the socialist countries.

As is well known, the development of the machine and program tools of the first ESZR series came to an end in 1972-1973, when series manufacture of these tools began. Soviet developers represented themselves in the

nomenclature of the series with three models—the ESZ 1020, ESZ 1030 and ESZ 1050. The performance of these was 20,000, 80,000 and 500,000 operations per second respectively. Experts from Bulgaria and Poland also participated in the development of the ESZ 1020 and ESZ 1030 computers.

In the course of designing these three computer models Soviet experts solved a number of technical and scientific problems; they developed basic principles for the electronic design of computers working with integrated circuits, methods for microprogrammed control of computers with various capacity, realization of modern input and output models, a system of uniform power units for computers working with integrated circuits and the satisfaction of international standards pertaining to codes, writing methods and carriers. They created a number of new peripherals, among which the exchanged magnetic disk stores merit special mention.

All computers of Soviet manufacture, or every functional group thereof, are supplied with the following peripherals: ESZ 5551 disk control unit; ESZ 5050 and ESZ 5056 magnetic disk stores with a capacity of 7.25 M bytes; ESZ 5010 magnetic tape units with a writing density of 32 bits/mm; ESZ 7030 and ESZ 7032 line printers; ESZ 6012, ESZ 6013 and ESZ 7010 punch card input and output units; ESZ 6022 and ESZ 7022 punch tape input and output units; ESZ 7906 alphanumeric picture screen system; ESZ 7064 graphic picture screen; ESZ 7051 plane plotter or ESZ 7052 and ESZ 7053 plotters; and ESZ 9011 punch card and ESZ 9020 punch tape data preparation equipment. A few of these, for example the ESZ 5010, the ESZ 7010 and the ESZ 7030, are versions of models developed earlier for the second generation computers.

In the course of further development it became possible to connect them to the ESZ standard interface. All other equipment was developed especially for the purpose of use in the ESZR.

Series manufacture of these computers and devices made possible realization of the prescriptions of the ninth five-year plan (1971-1975)—increasing the production of the computer technology industry 2.7 times. In the course of the ninth and tenth five-year plans Soviet industry produced several thousand computers in the ESZR series. Several thousand automated guidance systems and computer centers in various areas of the economy work with these computers. Simultaneous with the development and the introduction of series manufacture of the ESZR computers wide scale work was begun to create a centralized complex technical service organization and to develop instruction centers.

After completion of the first developmental phase, modernization of the machines of the first series began in the Soviet Union, in the course of which the possibilities of the computers were expanded and their technical and economic parameters were improved. Series manufacture of the ESZ 1022 and ESZ 1033 began in 1975-1976; these replaced the ESZ 1020 and ESZ 1030 types. Series manufacture of the ESZ 1052 computer, replacing the ESZ 1050, began in 1978. The capacity of the new machines was increased 1.5 to 3 times, with an insignificant increase in price. The capacity of the operational stores in the configurations delivered became larger, and it became

possible to connect the new 29 M byte disk units of Bulgarian manufacture. In these computers the operational stores are already semiconductor stores and they work with the aid of bipolar ICs.

Series manufacture of remote processing systems began in 1975-1976, in the course of which various types of multiplexors, terminals and line connectors (modems, error protection equipment, etc.) are being made. The ESZ 8400 multiplexor makes possible the use of 15 teletype or telephone lines with a speed of 50 to 2,400 bits per second. In its maximal version the ESZ 8402 multiplexor aids the transmission of information on 176 lines at a speed of 50 to 2,400 bits per second. The fastest multiplexor is the ESZ 8403, with a speed of 48 K bits per second on four lines. At this speed one can exchange information even between two computers. The simplest Soviet developed terminal is the ESZ 8570 based on an electric typewriter. For higher level tasks there is the ESZ 8504 which can be supplemented with picture screen, printer, plotting device, and a magnetic tape unit. From such equipment they have created and are successfully operating a remote data processing system and a few large capacity, collective use regional computer centers.

In accordance with the work program adopted by the member countries of the agreement developments aimed at creating a second series began with the preparation of the first series of the ESZR; in the course of this we must further improve the technical and economic indexes, carry the capacity limits farther and introduce new functional possibilities. Within the framework of the second ESZR series they have created in the Soviet Union a number of new computer models and many items of equipment of various types. Three computers are already in series production (the ESZ 1035, ESZ 1045 and ESZ 1060 models) and developmental work on the ESZ 1065 is continuing. The smallest of these is the ESZ 1035. Its capacity is between 125,000 and 200,000 operations per second, depending on the type of task; the size of its operational store is 0.2-2 M bytes; and the total channel capacity is about 1,600 K bytes per second. One unique characteristic of the ESZ 1035 computer is that with program and technical tools it can emulate the Minsk-32 computer. (As is well known, there are at present very many automated guidance systems operating in the Soviet Union which were created on the basis of the most widespread second generation computer. The ESZ 1035 will make it possible to convert these systems to ESZR technical devices without any special problem.)

The performance capability of the ESZ 1045 computer is 800,000 instructions per second and the capacity of its operational store can be between 1 and 4 M bytes; the combined throughput of the channels can reach a value of 5,000 K bytes per second. The high performance is given by a special accelerating device built into the processor; this significantly increases the speed of executing arithmetic operations. In its basic configuration this computer contains all the devices needed to create two or multi-computer systems. The computer is outstanding for its space saving design also--the entire processor and six channels fit into one standard ESZR cabinet. From the user viewpoint it is a very valuable property of the ESZ 1045 that it has a developed microdiagnostics system and a built-in diagnostic system operating down to the level of the printed circuits.

At present the ESZ 1060 is the highest performance ESZR computer in the Soviet Union and the other socialist countries manufactured in series. Its capacity exceeds one million operations per second, the capacity of its operational store is 2-8 M bytes and the throughput of its channels is 10-16 M bytes per second. One can find in this computer all those properties which characterize "super-high" performance computers--a buffer store, long word length, multi-layer access in the operational store, an accelerated multiplication unit and a separate cnntrol and diagnostic module.

All three computers described are made in harmony with the basic principles of the second ESZR series--they have an expended instruction system, virtual memory and expanded check and diagnostic devices.

Development of the largest ESZR computer has reached its concluding phase. Its performance capability will reach 7 million operations per second.

Simultaneous with starting manufacture of the new ESZR models the Soviet Union began manufacture of a series of new peripherals developed there. First among these we must mention the 100 M byte exchangeable magnetic disk stores, the ESZ 5066 units, which can be linked to the computer through the ESZ 5566 control unit. For the second ESZR series computers they are manufacturing in series a new punch card reader, the ESZ 5019, which reads 1,200 cards per minute, and the ESZ 6015, which reads 300 cards per minute. In addition there are the new ESZ 7037 line printer and the ESZ 7920 group display station in the development of which experts from the GDR, Poland and Czechoslovakia participated.

Soviet experts are leading the development of ESZR operating systems (OS-ESZ and DOS-ESZ). Several versions of operating systems have appeared already in the course of work in the ESZR area and there are program tools which further expand the possibilities offered by the operating systems. We would like to stress frist of all the contribution which Soviet experts made by creating the OKA data base management system and the KAMA remote processing control system. These are already being delivered to users. Soviet programmers developed a large number of applications program packages for the most varied applications areas, such as automated systems at various levels and automated engineering design systems using ESZR computers.

The above facts can characterize in a general way the contributions of the Soviet Union to that great work which is being done in the area of creating ESZR technical and programming tools within the framework of the multilateral computer technology cooperation of the socialist countries.

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DEVELOPMENT OF MAGNETIC STORES AT MOM

Budapest SZAMITASTECHNIKA in Hungarian Mar 82 pp 1, 7

[Article by M. T: "Development of Magnetic Stores at the MOM (Hungarian Optical Works): Keeping Up With the World Level"]

[Text] Relying on socialist cooperation and division of labor we have developed a variety of products of our computer technology industry in accordance with the conditions and traditions of our economy. The role of equipment of domestic manufacture is significant in satisfying domestic needs; at the same time, the volume of our export in the socialist relationship and the non-ruble accounting relationship is increasing. Our computer technology manufacturing industry is concentrated on a few enterprises--Videoton, MOM, the Telephone Factory, BRG [Budapest Radio Technology Factory], Orion and VILATI [Institute of Electrical Automation]. The names of most of them hardly betray what a variety of products come from their assembly lines. Just as the Telephone Factory manufactures not only telephone equipment and the Orion Radio and Electrical Works manufactures not only radios, television sets and high fidelity equipment so neither does the Hungarian Optical Works manufacture only optical instruments. In terms of value it is the second largest computer technology manufacturer in Hungary and a significant percentage of its production value consists of computer technology equipment.

The MOM has been active in instrument technology for more than 100 years but it has been developing and manufacturing computer peripherals for only the last 10 or so years. The development in this area at the factory has been at an imposing rate during so brief a time. Work started around 1970 with the production of punch tape peripherals. Adapting to the needs of the market, it has constantly modernized its product structure; the manufacture of computer technology devices developed into a branch making up one third of the production plan; and they are counting on further growth of 8-10 percent per year. The earlier forecasts--according to which punch tapes devices would have to be phased out and the manufacture of magnetic carrier devices would have to be realized in the 1980's--proved to be correct.

In the middle of February, at a conference organized jointly with the Computer Technology Department of the NJSZT [Janos Neumann Society of Computer Technology] and the Computer Department of the Measurement Technology and Automation Scientific Association, workers from the MOM reported--before a

large audience of about 130 persons--on their results achieved thus far in the area of magnetic peripherals and on their long-range developmental plans. (We would have liked to have heard a separate presentation on how the competitiveness of their products is judged from the commercial viewpoint on the world market, in both capitalist and socialist countries, with special regard to the market interest and cooperation readiness of the latter). In the survey and evaluative presentation by Jeno Gulyas, computer technology chief designer of the factory, we heard the following.

Floppy Disk and Fixed Magnetic Disk Stores

The MOM conducts applied research and development and manufacturing activity in two areas of magnetic carrier peripherals--floppy disk and fixed magnetic disk stores.

The floppy disk family contains a broad scale of both 8 inch and 5 1/4 inch versions. They are manufacturing series of several thousand units of the MF 3200 8-inch devices, which they developed themselves. Building on the technical and technological experiences with these they succeeded in developing devices interchangeable with the Shugart floppies, the most widespread in the world, which are competitive on every market (from the patent viewpoint).

The new 8-inch family is based on the MF 6400 design. This equipment is suitable for attaining double writing density, ensuring the technical parameters of the leading western devices. The MF 6400 D two-sided, double capacity version has undergone state and international tests with outstanding results. Series manufacture of the MF 6000 will begin in 1982 and that of the D version in 1983. The appropriate design and modern technology together ensure large series manufacture satisfying high quality standards.

The 5 1/4 inch floppy disk stores (minifloppy) also follow the above ideas. The MF 900 and MF 1800 devices--which are suitable for ordinary or double writing density--received the code numbers EC 5088 and EC 5809 in the successful ESZR [Uniform Computer Technology System] tests. Series manufacture of them will begin this year, and first of all will satisfy domestic needs!

Further development plans are aimed at a two-sided, double-band, double writing density drive unit with a capacity of 1 M bytes by 1984.

The work of the developmental experts also extends to preparation of various testing tools, manufacturing and servicing equipment, documentation and programs.

The MOM began manufacture of fixed magnetic disk, fixed head (head/band type) drive units on the basis of French (SAGEM) license and know-how. The independently developed versions of the basic type (DM 0.8) already have capacities of 1 and 2.5 M bytes. Another license was purchased from SAGEM in 1976. Series manufacture of a 5 M byte disk drive unit begins this year and the prototype of a further developed 10 M byte version will be prepared this year also.

It is a significant accomplishment that they were able to replace a number of capitalist import parts with those of domestic manufacture.

On the basis of license technology the MOM is already manufacturing ferrite heads, purchasing the basic material, and also on the basis of a license it is manufacturing the information carrying disks of the fixed magnetic disk drive units.

(They are also striving to replace the import of the read-write heads for the floppy disk drive units; the first experimental series will be manufactured this year.)

Further developmental possibilities for the head/band type drive units depend partly on the read/write head and partly on the information carrier disk. At the end of the 1970's a number of firms came out with so-called integrated head storage units which do not limit writing density. The MOM is also preparing to develop an integrated head and, together with sister institutions, is working on the further development of a metal layer disk. The goal is to develop highly reliable (an MTBF above 8,000 hours), large capacity (a minimum of 60 M tytes), short access time (10 ms) units.

Flexibly following the world trend, the program includes development of Winchester type disk drive units also. The manufacturers marketed an 8-inch type 1-2 years ago and widespread use began in 1980. The first larger applications of the 5 1/4 inch micro-Winchester are expected to appear this year. According to the ideas the MOM will have its products on the market in 1984--with a delay of only 2 years.

Technological Developments

Mariann Mokos spoke about the technological development needed for large series manufacture of the 8-inch floppy disk drive unit family. The high precision parts are worked with NC-CNC machines and classification of the subassemblies is done with various electronic tools. The coordination of mechanical and electronic assembly-testing processes has succeeded well. Swift servicing of the MF 6400 is ensured with modular construction. Every mechanical unit is connected to each electronic part with one connection, thus the parts being made in the various provincial factory units of the MOM can be shipped and assembled easily.

They tried to make the tuning in of the assembled devices as simple as possible. The final testing includes a dynamic reliability test, with which they test the resistance to various environmental effects. For this purpose they use equipment they developed themselves based on an 8080 microprocessor. This makes possible the measurement of a number of floppy disk drive units at one time.

Tames Kertesz described interesting new technical solutions regarding the parameters and applications possibilities of the MF 900 and MF 1800 minifloppy stores. We mention only two data to show the reliability of the devices: the so-called soft error is 10 to the minus 8 and the MTBF value is above 5,000 hours.

Jozsef Mara reported on the practical design experiences acquired in the course of development and manufacture of the head/band type drive units.

Solving the design problems of the head unit certainly meant a great success for the development experts of the MOM.

The Future Belongs to the Winchester Stores

We have already dealt in our journal with the Winchester stores, about which Tamas Kertesz gave a talk. (SZAMITASTECHNIKA, September 1981.)

The increasing capacity and decreasing size and price of computers made it necessary to develop a new type of magnetic background storage which will resolve the technical problems of the present types and provide large capacity with high reliability in a small size at a favorable price. This device is the Winchester drive unit. Its information carrier is a rigid, non-replaceable magnetic disk in a closed space on which the writing and reading of data take place with moving magnetic heads. The advantage is that with its use the capacity of background stores increases substantially, its reliability is good, similar to that of fixed head stores, it can be made to a floppy scale and its production cost is small. The disadvantage is that the disks cannot be exchanged, so the system also needs exchangeable disks.

The first Winchester type device--the IBM 3340 using a 14 inch disk--appeared in 1973. Since then various manufacturers have put another 88 types on the market. Their capacity ranges from 16 M bytes to 2,660 M bytes. With the spread of the 8-inch floppy disk stores a need arose for the manufacture of large capacity Winchester type stores of the same size and the first such device appeared in 1978, followed by another 61 types. These have a storage capacity of 5 to 64 M bytes. Mass use of the 5 1/4 inch minifloppy in desktop computers was followed by the development of micro-Winchester stores of the same size. Since the first such device, made in 1981, seven types have appeared; their storage capacity is 5 to 12 M bytes.

The technical solutions of the three types of different size are similar. The chief difference is that head movement in the 14-inch device is based on the technology for exchangeable disks while those of 8 and 5 1/4 inches followed the solutions used in floppy disk drive units.

Data format, internal control and the link to format control in the Winchester stores of the same size as floppy disk drives are organized in a way similar to that of a floppy disk. The reason for this is that in general they are used as stores supplementing one another. The floppy disk has a small capacity but it can be exchanged while the disk of the Winchester store has a large capacity and cannot be exchanged, but its data transmission speed is more than ten times that of the floppy disk.

Chief Technical Parameters of Two Well Known Types

	Shugart SA 606	BASF 6172
Capacity	10 M bytes	24 M bytes
Data transmission speed	4.5 M bytes/s	6.4 M bytes/s
Number of disks	3	2
Stepping time band to band	18 ms	8 ms
Mean data access time	75 ms	50 ms
Number of bandspper surface	160	600
Size	83 x 146 x 210 mm	115 x 230 x 460 mm

The appearance of the Winchester stores gave a new impetus to the development of magnetic disk stores. Costs can be decreased with series manufature; on the basis of the small size and reliable operation they fit in quickly into the present store hierarchy. The 8 and 5 1/4 inch Winchester stores are used in parallel with floppy disk stores (on a prepared market). This greatly increases the storage capacity of mini- and microcomputers.

It can be seen from the foregoing that Winchester stores can be developed and manufactured primarily by firms which have the special technology for and years of experience in manufacture of floppy disk drives and magnetic disks. The experts of the Hungarian Optical Works also expect developmental and commercial successes from the Winchester stores. But it is too early to speak of results.

We wish them good work and much success in realizing the plans to follow the world level.

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POSTAL LICENSING OF DATA TRANSFER EQUIPMENT

Budapest SZAMITASTECHNIKA in Hungarian Feb, Mar 82

[Feb 82, p 6]

[Text] At present the teletype and telephone network and the new line connected data network can be used to set up remote processing systems. On the data network Hungarian Posts provides all the equipment for data transmission between the interfaces of the terminals but on the telephone network it provides only the transmission medium for remote data processing systems and thus the subscriber must see to the line connection equipment as well as the terminals.

In accordance with Law II, 1964, concerning posts and telecommunications one can link to the telecommunications networks of the Hungarian Posts only equipment which has been tested by it and which is suitable from the viewpoint of telecommunications and technical security. Thus the line connection equipment (modems) to be used on the telephone network must be licensed.

The manufacturing or trading institutions and the user can request testing of the equipment. Requests for testing should be sent to the Postal Central Telegraph Office (PKTH), 18 Varoshaz u., Budapest V, mailing address 1368 Budapest, Pf 1.

The types pf postal classification are: individual license, temporary model license and model license. The individual license always applies only to the equipment tested and use according to a given mode. The Posts issues a temporary model license after testing a prototype. This license pertains only to the model tested and its purpose is to inform the manufacturer of the postal position prior to series manufacture. A model license can be requested only for products which are technologically identical and manufactured in series; the model license applies to all equipment of the same type and quality as the equipment tested. It is a condition for issuing a model license that the equipment tested meet the pertinent provisions of the CCITT, the postal requirements and the prescriptions pertaining to healthy and safe conduct of work.

The PKTH maintains a register of licensed equipment and can inform those interested about the use conditions fixed in the licenses.

We hope to fill a long felt gap by publishing in our present issue those units of domestic and foreign line connection equipment which can be used on the telephone network and which have a postal model license. In this way we would like to help experts setting up remote data processing systems to select the data transfer equipment. Thus the list does not contain equipment which is already obsolete or which cannot be obtained.

Hereafter we would like to make information on licensed line connection equipment a regular feature. We plan to publish a list once or twice a year--supplementing it with equipment licensed in the interim.

Line Connection Equipment Tested and Licensed by the Hungarian Posts

(Partial list, continuation in our next issue)

Model number; Manufacturing firm; Number of the model license; Transmission speed in bits per second; and How it can be used:

VT-60200; Videoton; VT-6-0040; 600/1200; in two and four line direct telephone links; in a connected telephone network with or without answering, with manual call initiation and manual or automatic call reception. The license is also applicable to the versions built in to the VT-56191 terminals and the VT-60291 or VT-60292 frames.

24 LSI; RACAL-MILGO; VT-6-0041; 1200/2400; in two and four line direct telephone links; in a connected telephone network. With LA III call handling equipment.

MPS 48; RACAL-MILGO; VT-6-0048; 4800/3200; in two and four line direct telephone links.

AM-1200; Orion; VT-6-0051; 600/1200; in two and four line direct telephone links; in a connected telephone network. The several members of the modem family are constructed as follows: AM-1200/E, without control channel or call answering; AM-1200/F, without control channel but with call answering; AM-1200/G, with control channel but without call answering; and AM-1200/H, with control channel and call answering.

AM-2400; Orion; VT-6-0057; 1200/2400; in two and four line direct telephone links. The license also applies to the AM-2400/F and the AM-2400/L versions, but in the latter case only to use in a local network.

VT-60300; Videoton; VT-6-0059; 1200/2400; in two and four line direct telephone links; in a connected telephone network with manual call initiation and manual call reception. The license does not apply to the multipoint operational mode provided by the modem.

VT-61400; Videoton; VT-A-0060; 600/1200/2400/4800/9600; in two or four line galvanic links.

TAM-601; TERTA; VT-5-0061; 600/1200; in two line direct telephone links; in a connected telephone network. Also with the TMM-600 monitor unit.

SEMA-TRANS 4802; TRT (French); VT-6-0063; 4800; in four line direct telephone links, in the duplex or semi-duplex operational mode; with manual compensating, without an answer channel.

3863/1; IBM; VT-6-0064; 1200/2400; in four line direct telephone links, in the point-point or multipoint operational mode. The equipment cannot operate with the V.26 modem.

TAM-201; TERTA; VT-2-0065; 200/300; in two line direct telephone links; in a connected telephone network, with the TMM-200 monitor unit also.

AM-12TD; Orion; VT-6-0066; 600/1200; a duplex modem prepared on the basis of the CCITT V.22 provisions. In the synchronous or start-stop operational mode. In two line direct telephone links; in a connected telephone network.

3864/1; IBM; VT-6-0067; 4800/2400; in four line direct telephone links, in the point-point or multipoint operational mode. Because of the modulation used it cannot cooperate with the V.27 modem.

[Mar 82, p 6]

[Text] In the previous issue of our journal we provided information on postal licensing of data transfer equipment.

This article could cover only a part of the line connection equipment licensed by the Hungarian Posts. The list was prepared on the basis of licenses issued up to 21 December 1981.

We would like to make this information a regular feature in the future. We plan to publish once or twice a year a list of newly-licensed equipment--depending on the number of licenses issued.

Line Connection Equipment Tested and Licensed by the Hungarian Posts

Model number; Manufacturing firm; Number of the model license; Transmission speed in bits per second; and How it can be used:

2200/24; RACAL-MILGO; VT-6-009; 1200/2400; in four line direct telephone links.

SZAM-32; MTA SZTAKI; VT-6-0022, maximum 3200; in two and four line direct telephone links; in a connected telephone network. It cannot operate with other types of line connectors or with terminals where there is a relationship between the loading factor of the time signal and/or speed.

S.8351; Siemens; VT-A-0025; 1200/2400/4800; in two and four line galvanic links. Can be operated at a speed of 9,600 bits per second in a four line link up to a circuit distance of 10 kilometers also.

TAM-200; TERTA; VT-2-0026; 200; in two line direct telephone links; in a connected telephone network.

TAM-600; TERTA; VT-2-0027; 600/1200; in two line direct telephone links; in a connected telephone network.

GH-2052; ITT-SRT; VT-6-0028; 600/1200; in two and four line direct telephone links; in a connected telephone network. The modem does not meet the CCITT prescriptions in every respect and so can be operated in a connected network only under definite conditions.

GH-2054; ITT-SRT; VT-6-0029; 1200/2400; in two and four line direct telephone links; in a connected telephone network. The modem does not meet the CCITT prescriptions in every respect and so can be operated in a connected network only under definite conditions.

FM-200; VILATI; VT-2-0030; 200; in two line direct telephone links.

5979; IBM; VT-A-0032; 2400/4800/9600; in four line galvanic links.

3872; IBM; VT-6-0033; 1200/2400; in two and four line direct telephone links.

SEMA-TRANS 1203; TRT (French); VT-6-0049; 600/1200; in two and four line direct telephone links; in a connected telephone network with manual call initiation and manual call reception.

SEMA-TRANS 1001; TRT (French); VT-6-0050; 1200/2400/4800/9600/19200/38400; in two and four line galvanic links.

MK-600; MIKI; VT-6-0053; 600-75; in two or four line direct telephone links. A simplex modem providing transmission on a 600 baud data channel and reception on a 75 baud return channel. The license applies to the modem card with the condition that it can be used only in telemechanical equipment manufactured by the Instrument Industry Research Institute (MIKI). To get authorization for putting it into operation the user must give the Posts the method of use.

MK-74; MIKI; VT-6-0054; 75/600; a simplex modem providing transmission on a 75 baud return channel and reception on a 600 baud data channel. The conditions for use are the same as those for the MK-600.

26 LSI; RACAL-MILGO; VT-6-0070; 1200/2400; in two and four line direct telephone links, in the point-point or multipoint operational mode, with a return channel with CCITT B type modulation. A RACAL-MILGO VA-100 speech adapter can be connected to the modem also.

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DRILLING INSTALLATION DEVELOPED FOR USE AT 10,000 METERS

Bucharest STIINTA SI TEHNICA in Romanian No 1, Jan 82 p 10

/Article by Dr Constantin Nedelcu/

/Text/ In Nicolae Ceausescu's speech on Romania's socioeconomic development in the 1981-1985 Five-Year Plan he mentions, among other things, that "Firm measures must be taken to combine forces for rapid development of the technologies needed to exploit ores and other useful substances. The petroleum and mining industries have vital tasks to perform. We must intensify the effort to discover new petroleum and gas reserves and to exploit them, with special emphasis on increasing the degree of secondary recovery and providing the nation with more petroleum and gases." To this end the party leadership assigned the task of starting drillings to very great depths, down to 10,000 meters in the first stage and to 15,000 meters later on, which will reveal both accumulations of useful substances and geothermal sources. This kind of drilling is of considerable scientific importance, because one of the most important problems is to determine the presence of hydrocarbons at depths greater than 6,000 meters and the nature and conditions of their deposits, and also to investigate the structure of the earth's crust (phenomena of the origin and migration of metal-bearing deposits) and to study the waters at great depths.

In connection with the important task assigned the petroleum specialists, Dr Eng Viorel Cristea of the Bucharest IPCUP /Design and Research Institute for Petroleum Equipment/ was kind enough to describe to us the new F 800-DEC installation for depth drilling at 10,000 meters. Its design has already been drafted by the chief design engineer, Aurel Ocneanu of the IPCUP, and the Ploiesti 1 May Enterprise is to complete its construction this year.

After a number of tests in the United States (the depth record being 9,583 meters) it was concluded that drilling at such depths under Romanian conditions would be too exprensive and consequently unprofitable, but depth drilling installations for 10,000 meters comparable to the F 800-DEC have been built in the last 2 years. Of course drilling at great depths presents special problems of securing suitable technical characteristics for the equipment of the installation. The very high temperatures and pressures that are encountered are very important conditions, or those of corrosion (especially the hydrogen sulfide content) etc.

Among the F 800-Dec installation's chief technical characteristics we note the recommended depth interval between 8,000 and 10,000 meters, the maximum work load at the hook of 800 tf, the entry power in the winch of 4,500 hp, and the maximum traction on the cable at the drum of 7,500 kgf.

In the driving mechanism of its main equipment the F 800-DEC is provided with direct-current electric motors, control by thyristors and feeding from a small alternating-current power plant,as well as four generating sets powered by 2,500 hp diesel engines. The installation also permits feeding from the alternating-current network. Moreover the new installation will be of the decentralized type, such equipment as the winch, the mud pumps and the rotary table being powered separately from their own direct-current electric motors. This makes the said equipment entirely independent and permits convenient arrangements for it at a worksite.

The F 800-DEC installation is designed for superior performances in drilling. Note that the concept of a drilling installation has been interpreted in a much broader sense, so that a number of elements are included that are important to depth drilling under any conditions, like installations to prevent gushers, an installation to cement the wells, a complete set of spare parts and devices essential to drilling, equipment to measure the drilling parameters, and mechanization devices.

A number of major problems arose in designing the new installation in connection with the power consumption of the selected measure. A diesel-electric drive with a small alternating-current power plant was chosen, in keeping with the world trend. That driving mechanism is the most economical one for depth-drilling installations because the electric power is transmitted to the bars of the small power plant, with a minimum consumption of fuel in the diesel engines. The fact that the auxiliary consumers (electric compressors, electric pumps, the lighting installation etc.) are also fed from the bars of the power plant also helps to save fuel.

The 6,800 kw capacity of the small power plant meets all the drilling requirements.

The drilling installation properly speaking takes up a modest proportion (21.3 percent) of the investment necessary to dig a well to a depth of 10,000 meters, as compared with the total value of the main groups of equipment (drilling bit 4.6 percent, production equipment 4.5 percent, drill collars and drive bars 5.8 percent, tools for drilling, casing and production 13.5 percent, installation to prevent gushers 11 percent, equipment for geophysical investigation and boring 20.5 percent, etc.). Note that except for the last group,of the equipment for geophysical investigation and boring, the total weight of the other groups of equipment is 4,700 tons including the installation properly speaking, which weighs 1,860 tons. Note also that the total value represented by digging a well is about 500 million lei.

Construction of this important installation, which will permit intensified exploitation and will lead to the discovery of new petroleum and gas reserves, is being aided by several institutions in addition to the IPCUP (ICPE /Research and Design Institute for the Electrotechnical Institute/, Electroputere Center for Research, Design and Technological Engineering, Resita Institute for Hydropower Equipment, etc.), among whose specialists we mention Engineers Iulian Gradisteanu, Virgil Jugureanu, Valentin Pele and Ioan Ramboltz and Technician Paul Martinescu.

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